



**Progression Framework**

**Science**

**Year Five**

# Progression Framework

## Introduction

The Progression Framework for science is divided into two parts: *Progression in concepts and Working Scientifically*:

- *Progression in concepts* is based on the statements relating to key ideas in science. It is split into Biology, Chemistry and Physics; within each of these a number of 'big ideas' have been identified and used to show how later statements progress from earlier ones. See below for more information about the big ideas.
- *Working Scientifically* is based on the main skill areas which are broadly viewed as processes (e.g. planning investigations, reporting findings). Each of these is then subdivided into individual skills. As the Programme of Study statements are by Key Stage rather than by year, these have been taken as relating to the second year of each Key Stage and statements have been developed for the previous year that represent progress towards that.

## Progression Framework for Science, Year Five

### Domain: Biology

'Big idea'	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
1) Living things can be classified according to observable features	There is no content for this Big Idea in Year 5.			
2) Habitats provide living things with what they need	There is no content for this Big Idea in Year 5.			
3) Living things exhibit variation and adaptation and these may lead to evolution	There is no content for this Big Idea in Year 5.			
4a) Life exists in a variety of forms and goes through cycles – Plants	There is no content for this Big Idea in Year 5.			
4a) Life exists in a variety of forms and goes through cycles – Animals	5.4b.1 Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird  LINKS 6.3.2; 5.5.1	Explain what a life cycle is, e.g. that kittens grow into cats, have kittens and die.	Identify similarities and differences in two different life cycles, e.g. sparrow and butterfly, with reference to eggs and intermediate stages.	Suggest similarities in the life cycles of a number of vertebrates, e.g. comparison of dog, human and bird embryos.
	5.4b.2 Describe the changes as humans develop to old age  LINK 6.3.2	Identify that people change as they age, e.g. recognise differences in appearance, abilities etc.	Describe the changes as humans develop to old age, e.g. trends in changes to size, weight, mobility etc.	Suggest why some of the changes that take place in humans happen, e.g. suggest why babies have disproportionately large heads compared to adults.

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5) The human body has a number of systems, each with its own function	5.5.1 Describe the life process of reproduction in some plants and animals  LINKS 3.4a.1; 5.4b.1	Describe the life process of reproduction in humans.	Describe in sequence the stages of reproduction in some plants and animals, e.g. dog and a thistle.	Compare the process of reproduction in animals and plants, e.g. compare and contrast fertilisation.
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### Domain: Chemistry

'Big idea'	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
1) Different rocks have different properties and the formation of soil & fossils can be explained	There is no content in this Big Idea for Year 5.			
2) Materials have physical properties which can be investigated and compared	5.2.1 Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets  LINK 5.3.1	Compare and group together everyday materials on the basis of their appearance and feel.	Test and sort a range of materials based on their physical properties.	Suggest why those properties might influence the selection of those materials for certain uses.
	5.2.2 Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Know that some materials will dissolve in liquid to form a solution.	Describe how some materials, e.g. sugar, will dissolve and can be retrieved.	Identify that some soluble materials are more soluble than others.
	5.2.3 Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Suggest how mixtures might be separated.	Justify separation techniques proposed, with reference to materials being separated.	Explain why a particular separation method might be more effective.

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	5.2.4 Demonstrate that dissolving, mixing and changes of state are reversible changes  LINK 4.4.1	Understand that some processes are reversible.	Show how the original materials can be retrieved from each of these changes.	Classify various processes relating to materials as reversible or irreversible.
	5.2.5 Explain that some changes result in the formation of new materials and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	Understand that burning is irreversible.	Identify reactants and products of chemical changes and recognise these as being irreversible.	Provide examples of when changes being irreversible are a good thing, e.g. making bricks, or not, e.g. nonbiodegradable plastic bags.

### Domain: Chemistry

'Big idea'	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
3) The physical properties of materials determine their uses	5.3.1 Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic  LINK 5.2.1	Give reasons for the particular uses of everyday materials, including metals, wood and plastic.	Use evidence to justify the selection of a material for a purpose.	Suggest limitations of the uses of selected materials based on test results.
4) Materials can exist in different states and that these states can sometimes be changed	There is no content in this Big Idea for Year 5.			

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## Domain: Physics

'Big idea'	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
1) There are contact and non-contact forces; these affect the motion of objects	5.1.1 Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object  LINK 5.2.1	Describe the effect of gravity on unsupported objects.	Explain that gravity causes objects to fall towards Earth.	Recognise that gravity acts between all masses, e.g. the Sun and the Earth.
	5.1.2 Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Recognise that motion may be resisted by forces.	Describe how motion may be resisted by air resistance, water resistance or friction.	Identify ways in which forces that oppose motion may be useful (e.g. bicycle handlebar grips) or a nuisance (e.g. bicycle chain).
	5.1.3 Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	Recognise that simple machines transfer force.	Describe how some devices may turn a smaller force into a larger one.	Explain, with reference to everyday contexts, why a force multiplier might be useful.
2) Day, night, month, seasonal change & year are caused by the position and movement of the Earth	5.2.1 Describe the movement of the Earth, and other planets, relative to the Sun in the solar system LINK 5.1.1	Recognise that the planets move, relative to the Sun.	Draw a diagram or use a model to describe planetary orbits.	Identify that the further out a planet is, the longer its orbit is around the Sun.
	5.2.2 Describe the movement of the Moon relative to the Earth	Recognise that the Moon moves relative to the Earth.	Draw a diagram or use a model to describe the Moon's orbit around the Earth.	Relate the Moon's orbit of the Earth to the Earth's orbit of the Sun.

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## Domain: Physics

'Big idea'	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
2) Day, night, month, seasonal change & year are caused by the position and movement of the Earth	5.2.3 Describe the Sun, Earth and Moon as approximately spherical bodies	Sketch the outlines of the Sun, Earth and Moon.	Describe the Sun, Earth & Moon as spheres.	Recognise that many heavenly bodies are approximately spherical.
	5.2.4 Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky  LINK 4.3.5	Relate day and night to the apparent position of the Sun.	Use a diagram or model to explain why the Sun seems to travel across the sky, and what causes day and night.	Explain the effect of a planet in the solar system rotating at a different rate to Earth.
3) Light & sound can be reflected & absorbed and enable us to see & hear	There is no content for this Big Idea in Year 5.			
4) Electricity can make circuits work and can be controlled to perform useful functions	There is no content for this Big Idea in Year 5.			

# Progression Framework for Science, Year Five

## Domain: Working scientifically

Process	Sub-process	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
1) Planning investigations	a) Pupils can ask questions	There is no content for this sub-process in Year 5.			
	b) Pupils can plan an enquiry	5.1.b.1 With prompting, plan different types of scientific enquiries to answer questions (+)	Pupil can plan investigations using different types of scientific enquiry.	Pupil can, with support, can answer questions using evidence gathered from different types of scientific enquiry, e.g. comparing life cycles of different plants using change over time, surveys and secondary research.	Pupil can answer questions using evidence gathered from different types of scientific enquiry.
	c) Pupils can identify and manage variables	5.1.c.1 With prompting, recognise and control variables where necessary (+)	Pupil can set up comparative and fair tests.	Pupil can, with prompting, identifies and manages variables, e.g. when exploring falling paper cones.	Pupil can identify and manage variables.
2) Conducting experiments	a) Pupils can use equipment to take measurements	5.2.a.1 Select, with prompting, and use appropriate equipment to take readings (+)	Pupil can, following discussion, follow guidance to use equipment, e.g. timer.	Pupil can, following discussion of alternatives, selects appropriate equipment, e.g. using a shadow stick and measuring length and angle of shadow.	Pupil can use appropriate equipment, such as meter rule, to take measurements, such as distance travelled.
	b) Pupils explore how to improve the quality of data	5.2.b.1 Take precise measurements using standard units (+)	Pupil can recognise importance of using standard units and measures accurately.	Pupil can take measurements that are precise as well as accurate, e.g. measuring the force needed to pull different shapes of boat through the water.	Pupil can consider how by modifying instrument or technique, measurements can be improved.



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c) Pupils understand the role of repeat readings	5.2.c.1 Take and process repeat readings (+)	Pupil can, with prompting, can take repeat readings.	Pupil can know how to process repeat readings, e.g. when timing falling objects.	Pupil can identify situations in which taking repeat readings will improve the quality of evidence.
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### Domain: Working scientifically

Process	Sub-process	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
3) Recording evidence	a) Pupils record work with diagrams and label them	5.3.a.1 Record data and results (+)	Pupil can use words and diagrams to record findings.	Pupil can start to use labelled diagrams to show more complex outcomes, e.g. comparing the time of day at different places on the earth.	Pupil can use labelled diagrams to show complex outcomes.
	b) Pupils can display data using labelled diagrams, keys, tables and bar charts	5.3.b.1 Record data using labelled diagrams, keys, tables and charts (+)	Pupil can use various ways to record evidence.	Pupil can, with prompting, use various ways to record complex evidence, e.g. when investigating how gears and levers enable a small force to have a larger effect.	Pupil can use various ways, as appropriate, to record complex evidence.
	c) Pupils can display data using line graphs	5.3.c.1 Use line graphs to record data (+)	Pupil can, with prompting, use line graphs.	Pupil can use a line graph to record basic data, e.g. length and mass of a baby as it grows.	Pupil can use line graphs to display complex data.
4) Reporting findings	a) Pupils process findings to develop conclusions and identify causal relationships	5.4.a.1 Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships (+)	Pupil can write a conclusion based on evidence.	Pupil can, with prompting, write a conclusion using evidence and identifying causal links, e.g. investigating what makes a parachute fall quicker.	Pupil can write a conclusion using evidence and identifying causal links.

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	b) Pupils use displays and presentations to report on findings	5.4.b.1 With support, present findings from enquiries orally and in writing (+)	Pupil can present findings either in writing or orally.	Pupil can, with support, display and present key findings from enquiries orally and in writing, e.g. suggesting reasons for similarities and differences between various animals.	Pupil can display and present key findings from enquiries orally and in writing.
	c) Pupils explain confidence in findings	5.4.c.1 With prompting, identify that not all results may be trustworthy (+)	Pupil can indicate individual results that might be suspect.	Pupil can, with support, indicate why some results may not be entirely trustworthy, e.g. when timing falling objects.	Pupil can, in conclusions, indicate how trustworthy they are.

### Domain: Working scientifically

Process	Sub-process	Progression statement	What to look for guidance (Working towards expectations)	What to look for guidance (Meeting expectations)	What to look for guidance (Exceeding expectations)
5) Conclusions and predictions	a) Pupils can analyse data	There is no content for this sub-process in Year 5.			
	b) Pupils can draw conclusions	5.5.b.1 Suggest how evidence can support conclusions (+)	Pupil can, with prompting, show how evidence supports a conclusion.	Pupil can show how evidence supports a conclusion, e.g. researching gestation periods of various mammals and relating them to adult mass.	Pupil can identify how an idea is supported or refuted by evidence.
		5.5.c.1 Suggest further comparative or fair tests (+)	Pupil can, with prompting, suggest further relevant comparative or fair tests.	Pupil can suggest further relevant comparative or fair tests, e.g. when testing materials for various properties to determine their suitability for an application.	Pupil can use evidence to suggest further comparative or fair tests that would develop the investigation.

